

ART. II. *Facts and Observations relative to the Disease commonly called Yellow Fever; as it Appeared on Board the United States' Ship Hornet in 1828, the United States' Schooner Grampus in 1829, and at the United States' Naval Hospital, Pensacola, in the Cases received from the Peacock, in 1830.* By SAMUEL BARRINGTON, M. D. Assistant Surgeon U. S. Navy.

IT was my intention, nearly two years ago, to have presented these remarks for publication, having then recently returned from the Pensacola station; but about that time, orders to one of the ships of the West India squadron induced me to postpone my design until after my return: supposing that, by another cruise in a topical climate, my observations would probably be more extended. The Erie, however, in which I last sailed, had the good fortune to perform her cruise and arrive in the United States, without having had a single case of malignant fever.

I have to regret that, in consequence of the medical journal of the Hornet having shared the fate of that unfortunate vessel, I have been obliged to trust much to memory and the few private notes taken on board, in the account of the disease as it occurred in that ship. The journal of the Grampus, (of which I was then surgeon,) is now in my possession; and also an exact copy from the journal of the hospital at Pensacola, kept by me when on duty there in 1830, containing the cases from the Peacock.

The disease made its appearance on board the Hornet while lying at Sacrificios, a small island about three miles from Vera Cruz, (Mexico,) in September, 1828. We had been there at anchor twenty-six days when the first decided case occurred. There was no epidemic in the city of Vera Cruz, excepting the Dengue; nor was the fever prevalent at any place where we had touched on our cruise. During the two months previous to this time, the weather had been clear and oppressively warm, with very little rain: the thermometer averaging 87° at noon; at no time above 90° nor below 79° . It was kept on the berth deck, immediately under the main hatch, in as cool a situation as any between decks. In the winter of 1827 the Hornet had undergone extensive repairs. She was "salted" and consequently very damp; the moisture collecting in drops on the beams, &c. when the atmosphere was charged with vapour.* When

* The sickness in the frigate Brandywine in her recent cruise to the West Indies, was attributed in a great measure to this cause, by Dr. W. P. C. Barton, her surgeon. See his "Hints," &c.

she was "broken out" at New York after her return in 1828, great quantities of mud and other filth were taken from her hold; and in her timbers and lower works was discovered a considerable collection of chips and shavings in a putrid state, which had fallen there during repair. The bilge water and smell from the hold in this ship were exceedingly unpleasant.

In the *Grampus* the first case occurred in July, 1829, while cruising off Cuba. The duty imposed upon this vessel caused her to be frequently in the harbours of Havana and Matanzas. For six or eight weeks before, and in the progress of the sickness, the thermometer ranged from 77° to 89°, averaging about 84°. The crew were necessarily much exposed night and day, and had often to lie down in their wet clothes and on a wet deck. This vessel was remarkable for her uniform neatness and cleanly appearance throughout. The bilge water smell was seldom perceived: the water coming out of the pumps perfectly clear.

How the *Peacock* was in these respects I have been unable to learn with satisfaction; I am informed that she was damp, from being salted. She was also "filled in," consequently without limbers; had a gun deck and a spar deck; being thus constructed for the Polar expedition. Before she arrived at Pensacola in August, 1830, there had been two cases of fever; both of which proved fatal. This ship had been once or twice at Matanzas, and several times at Havana, when the cables become coated with a dark offensive mud, of which they cannot always be completely cleared before being stowed away.

Of the causes of this disease, and the circumstances which are supposed to favour its origin, much difference of opinion has always existed; and as our evidence on this subject is mostly of a negative character, it is not probable that medical men ever will agree. Whether the remote cause be miasmata or animalculæ, it is not for me to discuss. With respect to the predisposing and exciting causes there is also much diversity of sentiment. In "lunar influence," to which so much importance has been attached by Dr. CALDWELL, (see Prize Essay in No. XVI. of this Journal, for August, 1831,) I have not the smallest faith. Patients were equally attacked at all periods of the moon, and the greater or less intensity of the disease appeared to be regulated by the temperature and changes of the weather. There is a strong belief with many that sleeping in the moonshine is at all times highly dangerous. In every vessel in which I have sailed, nothing was more common than to see the men sling their hammocks between the guns, and in other places on the spar deck, in warm nights, exposed for hours to the rays of the moon without the slight-

est ill effects. I have been particular in noticing and remarking to others this repeated exposure with impunity to "lunar influence." The following facts will illustrate the connexion between the degree of temperature and the progress of this disease. When the *Hornet* arrived at the Navy Yard, Pensacola, (in latitude $30^{\circ} 19' N.$) from Vera Cruz, (October 29th,) the thermometer had fallen to 69° . While here, (two days,) we had but two new cases. After leaving Pensacola, on our way to New York, no one was attacked until we got into the latitude of the southern capes of Florida, (about $24^{\circ} 30'$;) while here the temperature varied from 78° to 82° , and we had an increase of seven new cases to our sick list, two on the 5th, and five on the 7th November, and one more, being the last, on the 8th. From this time as we increased our northern latitude, and the thermometer gradually descended towards the freezing point, we had not another case, and those already attacked rapidly convalesced.

Of *prophylactics*, (in the comprehensive sense of the term,) a few words may be said. Cleanliness is among the most important; not only as applied to our persons, but also to surrounding objects, especially on ship-board. The bellows, or air-pump, of Commodore Barron, is a valuable contrivance for the displacement of foul, and introduction of fresh air below decks. It was not used in the *Hornet* while I was attached to her, nor in the *Grampus* or *Peacock*. On board the *Erie*, in her late cruise, it was constantly in operation. The chloride of lime is an important agent in purifying places inaccessible by the scrubbing-brush and holy-stone, and destroying the noxious effluvia of crowded apartments. That it is highly useful on ship-board has been sufficiently demonstrated. When it has been otherwise, I must incline to the belief that it has been carelessly or too sparingly employed. It was not used in the *Hornet* or *Grampus*, nor in the *Peacock*; although this latter vessel had it on board; but such was the confidence of the surgeon and other officers in the apparent absence of all cause of disease from an internal source, that it was not resorted to. It is now in general use in the West India squadron. In the late cruise of the *Erie* this article was dealt out unsparingly, and occasionally to the temporary annoyance of those on board; and I am convinced that to this, with the prompt and effective coöperation of the executive officer, in having every tangible part kept free from filth, may be chiefly attributed that ship's escape from the most alarming disease of the tropics. The chloride mixed with water was poured into the pump-wells, and distributed throughout the holds, chain lockers, berth deck and other parts. Its effects upon the bilge water was very evident to all. By experiments made on board ship, it was

ascertained that it required seventeen grains of chloride of lime to decompose the sulphuretted hydrogen contained in half a pint of bilge water. It must be remarked, however, that the Erie had the peculiar faculty of generating the most concentrated bilge water in the shortest possible time.*

Neither the rule laid down by CURRIE, to use gently stimulating drinks, nor that of MOSELY, to drink nothing but water, will admit of a general application. Previous habits must here be the guide. I have not observed that those who were accustomed to the regular and moderate use of spirituous drinks were more obnoxious to attacks of fever than others of rigidly temperate habits; on the contrary, and I regret to say it, (because it affords a pretext for the intemperate,) in two or three instances I have seen the abstemious carried off in a few days, while hard drinkers, under the same exposure, have escaped. But from all I have seen I am convinced that the temperate man has, as a general rule, the best chance. Lemonade, if not too freely used, is one of the most salutary and refreshing drinks in a hot climate.

Music, though not often regarded as a preventive, is in my opinion, an important mean of placing the system, through the influence of the common sensorium, in a favourable condition to resist the action of morbid causes. Smoking tobacco must also be enumerated among the means of keeping off attacks of fever in what are called miasmatic situations. In an infected atmosphere, particularly at night, I have seen and experienced sufficient, not to doubt its utility.

The question "is yellow fever contagious?" has been so completely decided in the negative, that additional evidence would be almost superfluous; but I must mention one striking proof, out of many I have seen, which of itself, should remove all doubt on this head. When the sick were brought from the Peacock to the hospital near Pensacola, their mattresses, blankets, hammocks and bags, as they came from the infected ship were regularly taken by the attendants to be aired, and their clothes washed. The beds and bedding of those who died were immediately removed by the same persons; and not in

* The opinion that sulphuretted hydrogen is the active ingredient in the supposed miasma of yellow fever cannot be sustained; but that disease will result from respiring a long time in an atmosphere strongly impregnated with this gas must be admitted. Experiments by Dupuytren and Thenard have shown that "air containing 1-1500th part of sulphuretted hydrogen is instantly fatal to a small bird; that containing 1-800th part killed a middle-sized dog; and a horse died in an atmosphere which contained 1-150th of its volume."—*Turner's Chemistry.*

a single instance was any one connected with the hospital attacked with the disease. The whole number of attendants, including officers and those who resided at the hospital, (the washerwoman, cook, and their families, two nurses and a porter,) was twelve, besides six or eight patients with chronic complaints, and four men from the Peacock who were temporarily engaged in attending upon their sick ship-mates.

"Can the yellow fever be taken more than once?" is another question "*adhuc sub judice*." I have never seen a person in a second attack, unless a relapse may be so considered. Three patients at the Pensacola Hospital informed me that they had had the disease before: two of them at Key West in 1823, and the other at New York, in 1822.

Symptoms and mode of attack.—In a majority of instances the onset was without any previous indisposition, and the time generally between sunset and sunrise. A pain was felt in the head, back, or extremities; frequently in all these parts: sometimes preceded or attended, at other times followed by a chilliness. In a few a violent pain was experienced for a short time in some one particular part, afterwards becoming general. In one patient on board the *Grampus*, the penis was the seat of this suffering: in another the attack was announced by a neuralgic affection of the right temple. In several the knees were alone complained of at first; and in four patients in the *Hornet*, a spasmodic affection of the muscles of the leg was the prelude. The pulse, during this time, appeared to maintain its natural condition, or nearly so. After a short time, (from half an hour to two hours or more,) reaction commenced; the head-ache became more violent; other pains continued unabated; the skin hot, even when coldness was complained of, and generally dry, but occasionally the reverse, cool and moist. The patient would sometimes say he felt hot and cold at the same time; the bowels were constipated; the pulse full, bounding, and frequent; in one it intermitted every eighth stroke. The eyes in the sanguine and robust were red, painful, and injected; the respiration hurried; urine sometimes suppressed, and in many cases a difficulty of swallowing existed. Nausea, irritability of stomach, and pain on pressure at the epigastrium, were almost constant symptoms. In many there was a vomiting of bilious matter in small amount, and a distressing sensation of thirst and internal heat. The tongue in some was furred, in others but little altered. The cerebral functions at this period were not perceptibly impaired; but expressions indicative of great and even unnecessary alarm were occasionally uttered. When the fever made its appearance in "*nervoso-bilious*" tempera-

ments, and in certain subjects not of this temperament, it seemed as if the energies of the constitution, or the "*vis medicatrix*" if you please, were not sufficient to produce reäction. The patient would tell you "he felt very unwell, but could not say how or where." These cases were always the most difficult to manage.

When the early symptoms were subdued by the judicious application of remedial means, convalescence and recovery rapidly followed. On the other hand, when these means were neglected, or, notwithstanding their use, the morbid action predominated, a different condition of things was soon presented to our notice. The stomach refuses to retain both drinks and remedies; and when not tantalized with either, will eject its own morbid secretions, however small in quantity; the bowels are either obstinately costive, or are stimulated, perhaps by medicine previously taken, to the frequent discharge of small brown, greenish or watery stools, attended with griping; hæmorrhage takes place from the gums or nose, or both, and blood is sometimes discharged per anum; delirium is now and then met with, but more frequently the patient lies in a comatose state; the skin becomes cooler and often covered with moisture; the wrists are cold; the tongue and teeth covered with a brown or bloody crust. The matter ejected from the stomach at first resembles flakes of a brown substance suspended in a watery fluid; the proportion of brown increasing at every recurrence of the vomiting. There is, with many, an inclination to sing; they are very restless in any position, sometimes jumping out of bed to lie a moment on the floor or deck; pitiful sighing, alternated with obscene remarks, and a desire for coition was not uncommon. An itching of the genitals, and a constant rubbing or pulling at them, was observed in nearly all the fatal cases on board the *Hornet*, and in several of those of the *Grampus* and *Peacock*. In some there was a strong desire to eat shortly before death. As the latter stage draws near, the breath becomes very fœtid; more particularly in those who used mercury freely; confirmed black vomit takes place; hiccup; the skin of the neck and face becomes of a bronzy yellow; the patient, if asked, will say he has no pain, and express a desire to get up and walk about, which indeed he often does; he will be picking at his lips and teeth; the belly occasionally distended with flatus, (meteorism;) the eyes become fixed and partly closed, showing only the white; subsultus; irregular respiration; heaving of abdomen; convulsions, resembling in some a fit of epilepsy; and finally death. Muscular strength is often retained to the last moment; and it is not unusual to see a patient rise from his bed, make some violent exertion, lie down and quietly expire.

Treatment.—(Hornet.) In the Hornet there were fifty-five cases, of which eight died. The disease was there treated, at the instance of Dr. BIRCHMORE, surgeon of the ship, at first on the mercurial plan, which was then considered the only legitimate one. It was afterwards varied, and with a better result; for out of the first twenty-six who were attacked, five died, and three only out of the remaining twenty-nine. After an efficient dose of calomel and jalap, calomel alone was given in the dose of grs. v.—viij. every three hours; and ung. hydrarg. rubbed in various parts of the body, the object being to excite salivation, in which condition two deaths occurred. Of the few who were bled, every one recovered. The precise number is not known; I find but three mentioned in my notes. The arsenical solution was prescribed in some cases without any good effect. In the latter stages the vol. alkali and sp. terebinth. were used without advantage. The charcoal was given once with apparent benefit. Antimonials invariably produced mischief. Tinct. opii, one hundred and forty drops in the commencement of the attack, before reëction was established, but the pain almost insupportable, was followed by prompt relief in my own person.

(Grampus.) In the Grampus the treatment was different. Having witnessed in the Hornet the inferiority of the mercurial plan, and being here in sole charge of the sick, I determined to pursue a course which to me at least seemed more in accordance with the pathological condition believed to exist. In this vessel there were thirty-six cases, and four deaths. When the attack was violent, and reëction considerable, attended with a full, active pulse, and severe head-ache, which happened in a majority of instances, I drew blood from the arm until a decided impression was evident upon the circulation. To attain this object, seldom less than twenty-four ounces, more frequently thirty-two ounces and upwards, would be required. This was sometimes followed by cups to the epigastric region, and when constipation existed, a mercurial or saline purge, aided by enemata. As a refrigerant, (in the common acceptation of the term,) the nitrate of potass was found very serviceable, with lemonade, cool barley water, flaxseed tea or gum water for drink. At the same time cold ablution was employed, which was very grateful as well as beneficial.

CASE I. James Spillman, marine, æt. 30, of intemperate habits.—September 3d. Was ashore yesterday “on liberty” and indulged freely in drink. Says he did not feel well in the morning, but did not complain, as that would have prevented him from going ashore. Has violent head-ache; skin warm; eyes injected; pulse full and frequent; nausea; foul tongue. Took sulph. sodæ, $\bar{\text{z}}$ j.; and arrow root.

(These symptoms were supposed to be caused by the stimulus of drink on the day previous, and for this reason he was not bled.)

4th. Has high fever, with pain in head and back; tongue coated; bowels slightly moved. Ordered cups to stomach, cold ablution, pulv. nitr. potas. gr. x. every three hours; lemonade, arrow root.

5th. Very bad last night; at times delirious; stomach very irritable; great difficulty in swallowing; pain at epigastrium; very little fever or pain in head. Ordered blister to epigastrium. Solut. sulph. quin. every two hours.

6th. Vomiting continues. The medicine was rejected. Gave him pure lime juice, which was of no service. About 10 A. M. yesterday, he commenced ejecting a dark fluid from the stomach, the colour becoming deeper towards night; this morning it is quite black. Blister drew well. Skin and eyes assuming a yellow tinge. Speaks altogether in Dutch; does not understand a question when put in English; have to employ an interpreter. Is very restless, and has lost the power of swallowing.

8 P. M. Spillman lay in a state of stupor during the day, without vomiting or taking any drink. His hands and feet became cold towards evening; the ears and other dependent parts assumed a dark appearance; skin over the neck and breast yellow. At a quarter before 7, after one or two very partial convulsions, he expired.

Post mortem examination at 8½ P. M.—The stomach was taken out and examined. It contained a gill or more of the matter of black vomit. The outer surface exhibited a dark spot near the cardiac, and another near the pyloric orifice, and a few large veins filled with blood. Internally the neighbourhood of the cardia and pylorus were in a state of gangrene. The mucous coat was thickened and of a dark red colour; the rugæ very large and prominent, and the vessels much injected. In some places were streaks of grayish matter, not easily removed, which by candlelight had the appearance of impure pus or lymph. The coats were easily separated from each other. The peritoneum was sound, as well as the liver and intestines, which, however, were only examined externally. The time allowed for the dissection was limited; it was performed by candlelight, and under many other disadvantages, which rendered it impracticable to prosecute it further.

Remarks.—It is evident that this case was improperly treated in its commencement; having been mistaken for nothing more than a drunken debauch, so common among men who go ashore “on liberty.”

CASE II. John Harrison, O. S. æt. 23, was attacked with the disease in a mild form on the 16th September, from which he was re-

ported convalescent on the 23d. On the 25th he experienced much uneasiness in the stomach and bowels from eating duff,* (or dough,) the day before, for which he was ordered salts and diet. On the 26th the ordinary symptoms of fever were developed, for which, (being considered too weak for the loss of blood,) were prescribed saline solution, enemata, cold sponging, barley water, &c.

27th. Complained greatly of his knees; otherwise as yesterday.

28th. Less fever; perspiration; frequent watery stools attended with pain; tongue clean; stomach irritable; is in great distress; constant sighing; urine suppressed; breath offensive. Ordered blister to epigastrium; effervescing draught; cold ablutions continued; thin sago.

29th. Vomited much in the night; great pain in limbs and head; skin cool; tongue still clean; pulse slow and feeble; urine comes freely; had frequent watery stools in the night; hæmorrhage from the gums; teeth covered with a dark crust. In the afternoon had frequent and painful vomitings of a black matter mixed with milk which he had been drinking; tongue dry and parched; pulse slow and weak; great pain in legs; straining, but no passage from the bowels. Ordered pil. opii, gr. ij. and sinapisms to calves of legs.

7 P. M. Has had some sleep; pain has left the legs; still vomits, but less frequently and with less pain; begs for another pill. Ordered opii, gr. iss., and repeat at midnight; cold tea for drink.

30th. Slept well, and only vomited once or twice in the night. Says he feels quite well, and wants to walk about—a bad sign—tongue dry in centre, edges moist; no pain any where.

7 P. M. Has been vomiting occasionally the same dark matter as yesterday; dozes a little now and then; respiration irregular; pulse slow; skin cool; hæmorrhage from gums continues; drinks weak coffee and milk, and sucks an orange; talks incoherently; sings “bonnie laddie;” says he is well; makes many ludicrous remarks. R. Opii, gr. iss.; milk and water for drink.

October 1st.—Very restless all night; talks, sings, and cries out constantly; vomited once this morning about a gill of the same black matter; pulse slow and weak; skin warmer; tongue dry; teeth covered with dark blood, which comes from the gums and corners of the mouth; skin and eyes of a dirty yellow colour.

2 P. M. Since morning he has taken nearly a pint of milk; pulse more frequent; vomiting ceased; gums do not bleed so much; sub-sultus tendinum; feet are cool, and when suspended from his cot, becomes livid.

9 P. M. Has been struggling in the greatest agony all the evening,

* A well known sailor's mess in imitation of plum-pudding.

and expired at fifteen minutes before nine. Being under way, the decks much lumbered, and it being desirable to dispose of his body as soon as possible, there could be no post mortem examination.

Remarks.—A relapse was here brought on by improper diet, eating duff, during convalescence from a former attack. It will be seen that hæmorrhage and black vomit took place before any opium was administered; of course not caused by that medicine, as Dr. POTTER says. In several cases it has been of the greatest benefit. Venesection here seemed to be contraïndicated by the debility consequent to the previous attack. But I now believe it might have been beneficially employed.

CASE III. William Jarvis, O. S. æt. 22. This was also a relapse, probably brought on by improper food; which, however, he denied.

Oct. 3d. Was attacked in the night with vomiting and purging, attended with pain in the bowels, for which he took chalk mixture with laudanum.

4th. Bowels relieved. Feels very weak and sick at stomach; eyes yellow, skin slightly so, and cool. Drank some thin chocolate, which agrees with him. Ordered to resume the sulph. quinin. which he had been using in his convalescence.

1 P. M. This morning he swallowed some pieces of orange, which occasion great pain at stomach and hiccup. Has partially vomited several times, but is not much relieved. Gave him ipecac. gr. xx. and some warm weak coffee. The emetic brought up some of the orange, and afforded temporary ease; but in three hours the severe pain returned to the stomach, and extended to the thorax, attended with great difficulty of breathing and general distress. Ordered blister to stomach; enema. Fell into a sleep, from which he awoke about midnight as from a dream, in great pain and anxiety. He had nearly recovered from this, when, a few minutes after 1 A. M. a sudden convulsion terminated his existence. He was perfectly sensible throughout the disease.

Post mortem examination. Done at sea, *Oct. 5th*, at 6 A. M. five hours after death.—The peritoneum exhibited its natural appearance, and the stomach but few marks of disease externally. It contained about half a pint of a watery fluid mixed with thickened mucus. The internal coat was thickened and inflamed, particularly near the pylorus, where it was dark-coloured and covered with grayish lymph. There was no black vomit. The blood-vessels were not injected as in Spillman's case; but there were several red spots here and there. The liver was light-coloured. The lungs and pleura showed no traces of disease.

There was no death in the Grampus after venesection.

(*Peacock.*)—The cases sent from the *Peacock* to the Hospital, Pensacola, were either of a more malignant character than those of the other vessels, or the treatment was not such as was calculated to produce an equally beneficial influence and successful result, as will be seen by the proportion of deaths. Out of thirty-eight patients admitted, nine died. Notes of these cases were taken by me at the bed-side of the patient. These were condensed or transferred verbatim into the journal, of which I have kept an exact copy; as well as of Dr. SHARP's account of each from the moment of attack to the time they were sent to the hospital. Dr. Sharp was then in charge of the medical department of the *Peacock*; her surgeon and assistant-surgeon being ill with the fever. The hospital surgeon, Dr. PAGE, was devotedly attached to the doctrines and practice of RUSH and POTTER, and the generality of tropical writers; consequently, the mercurial plan was here proposed. My objections, derived from a limited experience, were not to be successfully opposed to such authority; nor could I, with propriety, urge them. Yet I must, in justice to Dr. Page, (now deceased,) say that his faith in the ultra-mercurial practice began to be shaken, and towards the termination of the sickness, he admitted that a different mode of practice might be at least equally successful, and that our prejudices should rather be governed by the facts we see, than what we learn only from the authority of others. I do not mean to question the veracity or accuracy of Professor Potter, of Baltimore, when, in his lectures on yellow fever, in relating the success of his practice in three different years, he states that in the first year, out of seventy-two patients, only three died; in the second year, out of four hundred, only five died; and in the third year, out of forty-eight, not one died. Who has ever boasted of any thing like such success? May it not be asked, were they all cases of yellow fever? His plan was to give calomel in scruple doses every two hours, and to excite salivation if possible. The *Peacock*, when the sickness was prevailing among her crew, was anchored at Navy Cove, about four miles from Pensacola, on the opposite side of the Bay, and six miles from the hospital. The sick were sent off in boats as soon as possible after they were attacked; but they had generally been bled, or otherwise prescribed for, by Dr. Sharp, and I believe that many owe their lives to the prompt and judicious treatment they received on the spot. The quotations in the following cases are from Dr. S.'s statements.

CASE IV. Midshipman R. "was attacked on the 23d inst. (August,) with violent pain in the head and back. V. s. ad $\frac{3}{4}$ xiv. was ordered, No. XXIV.—August, 1833. 28

and an emetic of vin. antim. Yesterday v. s. ad \mathfrak{Z} xvj. R. Calomel, \mathfrak{Z} j. Barley water. I found him this morning with hot, dry skin; furred tongue; pulse soft and quick; less pain in back; a heavy, full pain in left temple. R. Ol. ricini, \mathfrak{Z} j." Symptoms on admission into the hospital, (August 25th,) fatigue and restlessness; skin very hot; tongue furred; pulse small, tense and frequent. Was bled \mathfrak{Z} viii.; cold water to head. Took calomel gr. xxx. in three powders, the last of which produced slight vomiting.

26th. This morning skin cooler; less head-ache; pulse frequent, but soft. Has had two light brown stools. R. Ol. ricini, \mathfrak{Z} j. Ordered frictions with ung. hydrarg. to arms and thighs; barley water.

1 P. M. Skin hot. Sponge with water and vinegar. Fainted in the easy chair. Repeat mercurial frictions.

9 P. M. Has had slight delirium; skin hot; stomach irritable; acid eructations. R. Magnes. calc. \mathfrak{Z} j. Bene water* for drink. Cold to head, &c. continued.

27th. Very restless in the night, with occasional delirium; had a few small stools of a yellow, watery substance mixed with magnesia. Skin quite cool this morning, and inclined to moisture; that of forehead yellow; stomach irritable and painful on pressure. Applied sinapisms to epigastrium and to the legs. Ung. hydrarg. to groins and arm-pits.

1 P. M. Irritability of stomach continues; eyes yellow. Ordered effervescent draught.

4 P. M. Has hiccup; mind wandering; inclination to sing. Cont. mist. efferves. p. r. n.

8 P. M. Delirium increasing; frequent hiccup; pulse slower and weak. Applied blisters to epigastrium and lower extremities. Wine sangaree for drink, is unable to swallow it.

28th. Continued in a comatose state all night, with occasional sighs and hiccup. Lower extremities becoming cool. Blisters have not irritated the skin. Face and neck yellow; small quantities of a brownish fluid discharged from the stomach; breath offensive; eyelids nearly closed, showing only the sclerotica.

1 P. M. Is insensible to surrounding objects; confirmed black vomit; is unable to swallow any thing; heaving of abdomen.

3 P. M. Respiration short and convulsive; pulse sinking; extre-

* A single leaf of the bene plant, (*Sesamum orientale*), in a tumblerful of water, forms one of the most grateful and refreshing drinks that can be given to a fever patient; and from its being colourless and almost tasteless, is seldom refused.

mities cold. Died at half past 5 P. M. There was no examination after death.

CASE V. Frederick Lambert, "was attacked yesterday afternoon, (August 28th,) with a chill, pain in the head, and other attendant symptoms of 'fever.' I bled him to the amount of $\mathfrak{h}\mathfrak{i}\mathfrak{i}\mathfrak{j}$, and gave him calomel, $\mathfrak{g}\mathfrak{j}$. which has operated once." On admission into the hospital very little was required to be done. He took calomel on the 29th and 30th, 'by way of security;' but his convalescence may be dated from the first day of the treatment.

CASE VI. J. D. R. master's mate, was taken ill last evening, (28th,) and brought to the hospital this morning. No account of his case. Says he took some medicine last night, (supposed to be calomel.) Bowels have been twice opened. Present symptoms. Slight head-ache; skin warm, but moist; tongue furred; pulse small and frequent; no pain at epigastrium. Ordered calomel, $\mathfrak{g}\mathfrak{j}$. At 11 A. M. ol. ricin. $\mathfrak{z}\mathfrak{j}$. At 12, calomel, $\mathfrak{g}\mathfrak{j}$. Barley water.

12 M. Has head-ache; skin hot; pulse frequent, tense and quilled; eyes injected. Was bled $\mathfrak{z}\mathfrak{x}$. Cold water to head.

2 P. M. Calomel, $\mathfrak{g}\mathfrak{j}$. Cold water continued.

5 P. M. Has had three bilious stools; some fever; inclined to sleep. Repeat calomel, $\mathfrak{g}\mathfrak{j}$. at 12, (nocte.) Drinks and cold applications as heretof

30th. Head-ache; skin warm; tongue furred; pain at stomach. Took calomel, $\mathfrak{g}\mathfrak{j}$. at 8 A. M. At 11 the febrile symptoms increasing, was bled $\mathfrak{z}\mathfrak{v}\mathfrak{j}$. which gave relief.

2 P. M. Has had several very copious dark green stools; has been asleep, vomited a small quantity of blood. Ordered ung. hydrarg. rubbed on abdomen. Arrow root.

6 P. M. Delirium; says some one in the room is going to kill him. Ordered sinapisms to lower extremities. Enema. Calomel, $\mathfrak{g}\mathfrak{j}$. at midnight.

31st. No fever this morning; less pain in head and stomach; mouth becoming sore; is less alarmed at his situation; stools green. Ordered calomel, $\mathfrak{g}\mathfrak{j}$. at 10 A. M. Tea, barley water.

1 P. M. Has an exacerbation; tendency to coma; head-ache; skin warm; pain at epigastrium. Ordered sinapisms to ankles.

3 P. M. Feels better; fever subsided R. Calomel, $\mathfrak{g}\mathfrak{j}$. Barley water.

11 P. M. Vomits a dark-brown, flaky liquid. R. Calomel, $\mathfrak{g}\mathfrak{j}$. at 1 A. M.

September 1st.—Black vomit; wrists cold; pulse scarcely percepti-

ble. Ordered aq. calcis, \bar{z} ss. At 10 A. M. R. Pulv. carbon, \bar{z} ss. every two hours. Bottles of hot water to lower extremities.

2 P. M. No return of vomiting since 10 o'clock. Continued charcoal and hot water to extremities.

3 P. M. Rejected the last dose of charcoal.

6 P. M. No vomiting since 3 o'clock; pulse more developed.

2d. Very noisy and restless all night; cannot swallow; rises frequently from bed; stupor; pulse thready, and can hardly be felt; feet and hands cold.

Died at 2 P. M.

CASE VII. Simeon Philips, seaman, æt. 26, "was attacked this morning, (August 29th,) with pain in the head and back, and other symptoms of the 'fever.' I bled him \bar{h} ij. and gave him calomel, \bar{z} j." Admitted into the hospital at 9 A. M. Pulse slow, (48,) and soft, skin cool and moist. Took to-day calomel, \bar{z} j. and the same followed by ol. ricin. \bar{z} j. on the 30th. Was doing well until the afternoon of the 31st, when the stomach became irritable, attended with pain in back and abdomen, and restlessness. A blister was ordered to the epigastrium, and calomel, \bar{z} j. The next day salivation took place, and he slowly convalesced.

CASE VIII. Thomas Bowden, second seaman, Sept. 13th, "was attacked yesterday afternoon with excruciating pain in back and head, skin hot and dry; pulse strong, quick and very voluminous. Bled him ad \bar{h} iv. before the pulse was reduced. Ordered calomel, \bar{z} j. Enemata of warm salt water every four hours. Rice water for drink." Was reported convalescent on the 15th.

CASE IX. Lieutenant H. This was one of those insidious cases referred to, as occurring in peculiar temperaments. It did not at first seem to be one which would require or bear bleeding. About the fifth and sixth day of the disease he appeared to be approaching to convalescence. At this time he had taken calomel to the amount of \bar{z} ij. in doses of \bar{z} j. each. On the seventh day an unfavourable change took place. He became delirious; his tongue and jaws were sore; was very restless. On the eighth day these symptoms increased. The parotid glands were swollen and painful; the tongue and mouth sore, but there was no salivation: the mercury here, probably displaying its toxicological rather than its remedial agency. The eyes and skin became yellow, and the breath offensive.—Tenth day. The swelling of the parotids somewhat subsided and without pain.—Eleventh day. Occasionally spit a small quantity of blood.—Thirteenth day. A small black spot appeared on the tumour of the right side. Died in the afternoon.

After death a large quantity of frothy, offensive matter, resembling the foam of ripe porter, issued from the right nostril. No dissection.

CASE X. M. Hartnett, carpenter, "complained on the 7th, (September,) of the following symptoms—dizziness; sickness of stomach; languor; loss of appetite; tongue and mouth dry; pulse soft; bowels constipated. Ordered calomel, gr. xv. At 5 P. M. ol. ricin. $\bar{3}$ j.; drink rice water. Yesterday, (8th,) felt weak; tongue and mouth still dry; pulse as before; an uneasy sensation about the stomach; slight head-ache. Ordered enema of rice water every three hours. At bed-time a blister to epigastrium, and but little drink, as there was some irritability of stomach." Received at the hospital on the 9th, about noon.

Symptoms on admission—says he has no pain; skin dry; tongue dry and coated; great expression of anxiety; bowels open; pulse frequent and weak; stomach irritable; strains very much while vomiting blood, and a dark matter mixed with the fluids of the stomach; perfectly rational, and alarmed at his situation. — R. Aq. calcis, $\bar{3}$ ss.; p. r. n. Constant moaning.

2 P. M. Nothing retained by the stomach; black vomiting continues. R. Acet. plumbi, $\bar{3}$ ss.; aquæ, $\bar{3}$ j.; M. s. $\bar{3}$ ij. every half hour.

7 P. M. Swallows with great difficulty; throat very sore; stomach less irritable; retains barley water.

10th. Incessant pitiful sighing; teeth gummy; black crust on gums, lips and tongue; pulse frequent and weak.

10½ A. M. Extremities cold; no pulse; eyes fixed; convulsive breathing; cheeks yellow.

Died at fifteen minutes before 11 A. M.

No calomel was given to this patient while in the hospital. Black vomit took place on the morning of his admission, and was temporarily checked by the acet. plumb.

Post mortem examination, three hours after death.—The stomach was distended with flatus; vessels of omentum and mesentery engorged; a few enlarged vessels on the external surface of the stomach. Liver lighter coloured than natural. Stomach contained about four ounces of black vomit mixed with particles of pus or mucus. The internal coat was smooth; no appearance of rugæ or villi; patches of grayish lymph or mucus adhering to it; pylorus thickened. There was not time allowed for a more minute examination.

CASE XI. M. S. Aydon, marine, æt. 23, September 7th, admitted at 6½ P. M.—"Was attacked last evening with pain in the head and

back; skin hot and dry; pulse quick and soft. Was bled to faintness. Took this morning calomel, ℥j.; v. s. repeated ad $\frac{1}{2}$ ss. and an enema administered." Present symptoms—head-ache; fever; tongue furred; no pain at epigastrium. R. Calomel, ℥j. Barley water.*

8th. Bowels opened several times; last discharges yellow. At 10 A. M. R. Calomel, ℥j.; drink as before. At 2 P. M. R. Calomel, ℥j. which produced nausea, followed by vomiting of a black, flaky liquid; eyes and countenance bronzy. Ordered aq. calcis, p. r. n. Skin hot; strength good.

7 P. M. Has been bleeding at the nose; pain at epigastrium; has had a copious black stool.

8 P. M. Vomits the same black liquid. Continued aq. calcis.

9th, at 1 A. M.—Black vomit; limbs drawn up; eyes wild; skin hot; pulse quick; constant groaning. Ordered sinapisms to feet; cold ablution. R. Acid. muriatic, ℥ss. in aqua, ℥ij.; drink with an equal quantity of barley water.

2 A. M. Flighty; skin cool; pulse moderated.

8 A. M. Skin cooler; pulse frequent and weak; pain at epigastrium; still vomits.

10 A. M. Blister to stomach. Skin yellow.

2 P. M. Says his teeth are loose; breath mercurial; stomach still irritable. Ordered aq. calcis, p. r. n.

7 P. M. Has been bleeding freely from the nose; less vomiting; blister well drawn; dress it.

10th, at 8 A. M.—Eyes fixed; heaving of abdomen; lips contracted and frothy; pulse very feeble; hands and feet cold.

Died at 9 A. M. After death frothing at the mouth. The muslin bandage on the head was soaked with a putrid, bloody foam.

CASE XII. John Fullerton, "was attacked this morning, (September 10th,) with violent pain in the head, back and limbs; chilliness; pulse slow and labouring; skin hot and dry; nausea, &c. Ordered v. s. ad $\frac{1}{2}$ ss. which relieved the pulse and caused vomiting." Was brought to the hospital at 1 P. M. Says he was in the market boat, and taken ill about 6 A. M. Complains of pain in head; back and limbs; is very restless; easy in no position; pulse slow and feeble; skin cool; tongue furred. R. Calomel, ℥j.; barley water. At 4 P. M. calomel, ℥j.

8 P. M. Has been vomiting his drink; pulse quick; skin warm; restless. R. Calomel, ℥j.; drinks continued. Repeat calomel at midnight.

* From Aydon's own account, it seems that he was unwell several days before he reported. Says he has eaten nothing since Thursday last, four days.

11th. Has pain in head and back; no fever; pulse 80; gums white; very restless; vomited some green bile this morning; has black stools.

9 A. M. R. Calomel, ℥j. and barley water.

1 P. M. R. Calomel, ℥j.

4 P. M. Very little pain; not so restless; stools yellow. R. Calomel, ℥j. to be repeated at 8 P. M. and 12, (nocte.)

12th. Head-ache continues; eyes dull and heavy; uneasy in bed; skin cool; pulse 80. R. Calomel, ℥j. and ung. hydr. to be rubbed in the groins. Calomel, ℥j. at 12. At 12½ vomited a yellowish liquid, containing brown flakes. R. Calomel, ℥j. at 4, and ung. hydr. to groins.

6 P. M. Comatose; rejects his drinks. Ordered calomel, ℥j. at 8 and repeat at 12, (nocte.)

13th. Still comatose; skin cool and clammy; stomach still irritable; had a bilious stool. R. Calomel, ℥j. at 10, and ung. hydr. continued.

2½ P. M. Vomiting continues. R. Calomel, ℥j.

7 P. M. Very uneasy; eyelids half closed; still vomits. Ordered blister to epigastrium.

14th, 8 A. M. Passed a restless night. Blister drew well; eyes and skin of cheeks becoming yellow; stomach very irritable; pulse small, slow and weak; skin cool and clammy. R. Mist. efferves. every half hour. Hot bricks to feet.

12 M. Stomach retains nothing; hands and feet cold; pulse very weak.

At 2 P. M. R. Sp. terebinth, ℥ij.; sac. alb. et farinae q. s. mucil. gum Arab. ℥j. M.—a tea-spoonful every half hour.

8 P. M. Has not vomited for some time; pulse slow and weak; restless. R. Calomel, ℥j. at 12, (nocte,) and at 4 A. M.

15th, at 8 A. M. Spits and vomits in small quantities a black flaky matter, mixed with the fluids of the stomach; extremities cold; skin and eyes of a dirty yellow; refuses medicine, &c.; sweat profusely in the night; no pain, but is restless.

1 P. M. Heaving of abdomen; black vomit; hiccup; delirium. Died at 6 P. M.

The total amount of calomel taken by this patient was ℥vj. and yet neither the mouth nor salivary glands were affected.

Post mortem examination.—The brain only was examined, and that but partially. The vessels of the pia mater were injected. The sinuses were empty. About ℥ij. of bloody serum in the ventricles. Vessels of the plexus choroides congested. The dissection was not prosecuted further, for reasons which need not here be mentioned.

CASE XIII. Dr. S. admitted at 6 P. M. September 15th. Was attacked about 8 o'clock this morning with a chill; shortly afterwards, pain in back and abdomen, followed by fever. By his own direction he was bled $\frac{1}{2}$ ss. had thirteen leeches applied to the stomach, took a warm bath, calomel, \mathfrak{z} j. and an enema. On admission had very distressing pain in the loins and about the umbilicus; could not rest a moment in one position; skin warm; pulse full and frequent; tongue furred.

At 6 $\frac{1}{2}$ P. M. Ordered an enema, which brought away a considerable quantity of dark fecal matter, and relieved the pain in the abdomen. Took ol. ricin. \mathfrak{z} j. which was rejected.

9 P. M. Still has very great pain in back; skin cool and moist; pulse frequent. Took a Seidlitz powder; and the back was rubbed with a stimulating liniment.

At 10 P. M. The pain continuing very intense, gave him tinct. opii, \mathfrak{z} j. which in half an hour was followed by relief, and he fell asleep.

16th. Has had a comfortable night. Is free from fever and pain. Was convalescent on the 20th.

Many more cases might be cited to illustrate the comparative value of the different modes of treatment; but they have already exceeded the limits originally intended. I will conclude the account of the cases from the Peacock, by a tabular view of the time required for a cure in the mercurial and non-mercurial plans.

Of seven patients who were treated in the first method,

One took of calomel 5 scruples, and was fit for duty in 20 days.

Do.	7	"	"	22
Do.	10	"	"	28
Do.	11	"	"	22
Do.	12	"	"	22
Do.	13	"	"	22
Do.	15	"	"	39

All of these were salivated.

Of seven who were treated on the non-mercurial plan,

Two were well and fit for duty in 11 days.

One	"	"	12
One	"	"	17
Two	"	"	19
One	"	"	20

Of the nine fatal cases, eight were treated with mercury; of whom five were salivated, or had the mouth affected.

The remaining cases underwent a mixed plan of treatment. In some of them calomel was used, but not with the view of salivating. These recovered in from sixteen to twenty-six days.

Of the four deaths in the Grampus, three took place on the seventh, and one on the fifth day. Of the eight deaths in the Hornet, one took place on the third day, two on the fifth, four on the seventh, and one on the eighth day.

Of the nine deaths among the Peacock's patients, three took place on the fifth day, three on the sixth, one on the seventh, one on the thirteenth, and one on the twenty-eighth. This last one died from a mortification and extensive sloughing of the cheek and upper jaw, consequent to salivation.

Recapitulation.—Of the whole number of deaths above-mentioned, (viz. twenty-one,) one took place on the third day, six on the fifth, three on the sixth, eight on the seventh, one on the eighth, one on the thirteenth, and one on the twenty-eighth.

From the account here given, and its accuracy may be relied on, it must be evident to every unprejudiced mind, that the mercurial treatment of yellow fever is not what it has been so long considered by a majority of writers on this disease, the only rational and successful mode of management. In many cases the prevailing symptoms have been certainly aggravated, and new ones brought into existence. But I have also seen the disease "broken," as it were, on the appearance of a sore mouth, or a flow of saliva; and "post hoc, ergo propter hoc" is always triumphantly applied to such fortunate coincidences.

Philadelphia, March 30th, 1833.

ART. III. *Cases and Observations regarding Puerperal Fever, as it prevailed in the Pennsylvania Hospital in February and March, 1833.* By HUGH L. HODGE, M. D. one of the Physicians of that Charity.

FEW circumstances more frequently baffle the scrutiny of the scientific physician than the causes of epidemic diseases. They seem involved in a mystery, to us impenetrable, but which future generations, assisted by the lights of new, or improved sciences, may possibly elucidate.

The fact, that puerperal peritonitis should ever prevail in the Penn-